

## **The Use of Multispectral Thermal Infrared Data to Map Sulfur Dioxide Plumes**

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The launch of NASA's Earth Observing System (EOS) AM-1 platform in 1998 will put two multispectral thermal infrared (TIR) imaging instruments into Earth orbit. The Advanced Spaceborne Thermal Emission and Reflectance Radiometer (ASTER) will provide TIR image data with a spatial resolution of 90 m (at nadir), while the Moderate Resolution Imaging Spectrometer (MODIS) will provide TIR imagery with a spatial resolution of 1 km (at nadir). Both ASTER and MODIS will possess spectral channels that span the sulfur dioxide (SO<sub>2</sub>) spectral features at 8.5  $\mu$ m.

Data collected during deployments of TIMS over Mount Etna (July 1986) and Kilauea (September 1988) volcanoes demonstrate the potential contributions of TIR imagery to volcano monitoring. These data have been used to determine that the Etna and Kilauea SO<sub>2</sub> plumes will fall within the detection limits of MODIS and ASTER, respectively. The ability to map low-altitude, quiescent SO<sub>2</sub> plumes from space will augment the existing capabilities of the satellite-borne Total Ozone Mapping Spectrometer (TOMS) and Advanced Very High Resolution Radiometer (AVHRR) instruments to map the SO<sub>2</sub> and ash clouds resulting from explosive eruptions.

On more recent deployments (November - December 1996), TIMS data have been collected in tandem with Airborne Emission Spectrometer (AES) data over Kilauea and White Island (New Zealand) volcanoes. These data provide a unique opportunity to compare SO<sub>2</sub> retrieval algorithms. In addition, TIMS data have been acquired over a coal-fired power plant (September 1996) in an effort to validate the SO<sub>2</sub> retrieval algorithm. The analysis of these data are in progress.